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often astonishing. She was a pioneer in scientific management in the case of the individual as well as of the institution and aimed for the maximum of efficiency for the individual and the race. Environment as expressed in food, shelter and clothing was but the means to an end, the betterment of the race.

Mrs. Mary J. Lincoln, first principal of the Boston Cooking School, told of Mrs. Richards's help in the early days of that institution (now merged with Simmons College), how she sometimes lectured at the school and more often the pupils went to her. At a later period when Mrs. Lincoln was preparing a text-book for public schools, Mrs. Richards gave advice and read proof. "Be careful, that may not be so in ten years," "Better say, 'so far as we know now,'" were some of her comments which prove how her own words were to be trusted.

Of particular interest was the announcement made by Mrs. Caroline Weeks Barrett, chairman of the Ellen H. Richards Home Economics Fund committee. This committee is soon to make definite announcement regarding the memorial to Mrs. Richards which will take the form of a fund to be administered for research and publication for advancing the interests of the home.

We could not think of putting up a dead thing as a memorial to Mrs. Richards, a bronze tablet or even a building. She was a living argument for home economics. How shall we keep her alive? We must give her earthly immortality through a living memorial, something which shall continue to do Mrs. Richards's work with Mrs. Richards's spirit. For this woman who believed in the impossible and helped it to come to pass it is not impossible for us to raise a hundred thousand dollars in dollar subscriptions from those who have felt her influence, to be invested by a board of trustees and used under their direction to establish the *Journal of Home Economics* and later for lectureships, research and publication according to the needs of the time. The collection of funds by personal canvass is soon to be initiated in a country-wide campaign which will enlist committees numbering over a thousand persons who will seek this uniform democratic contribution from men and women interested in advancing the welfare of the home through a memorial to this

woman who as scientist and social engineer did so much for the home.

#### SCIENTIFIC NOTES AND NEWS

AMONG the British New Year's honors are knighthoods conferred on Professor W. F. Barrett, F.R.S., formerly professor of physics in the Royal College of Science, Dublin, and Professor E. B. Tylor, F.R.S., emeritus professor of anthropology in the University of Oxford.

M. LIPPMAN has been elected president, and Professor Guyon vice-president, of the Paris Academy of Sciences.

THE Academy of Sciences at Bologna has awarded the Élie de Cyon prize of 3,000 lire to Professor E. A. Schäfer, of Edinburgh.

THE senate of St. Andrews University has resolved to confer honorary degrees *in absentia* upon gentlemen chosen for the degrees on the occasion of the celebration of the five hundredth anniversary of the foundation of the university in September last, but who were unable to be present. Among them is Dr. Charles D. Walcott, geologist, and secretary of the Smithsonian Institution.

COLUMBIA UNIVERSITY has designated as Jesup lecturer for 1912-13 Professor H. T. Morgan, of the department of zoology. His lectures will be delivered at the American Museum of Natural History. Professor W. P. Montague, of the department of philosophy, has been appointed to deliver the Hewitt lectures at Cooper Union in the spring of 1913.

MR. RAYMOND A. PEARSON has resigned the office of commissioner of agriculture of the state of New York.

PROFESSOR JOHN B. WATSON, of the Johns Hopkins University, has recently been granted a three years' appointment as a research associate of the Carnegie Institution of Washington, in order that he may study the migratory and other instincts of the sea-gulls of the Tortugas, Florida.

AN expedition to Montego Bay, Jamaica, is about to be undertaken by the department of marine biology of the Carnegie Institution of Washington. In addition to the director, the

investigators will consist of Professors David H. Tennent, Gilman A. Drew, Robert Tracy Jackson, H. L. Clark, H. E. Jordan, R. L. Cary and E. E. Reinke. Mr. George Gray, of Woods Hole, will accompany the expedition as collector.

PROFESSOR M. M. METCALF, head of the department of zoology of Oberlin College, has been granted leave of absence for the second semester to carry on research work in the Marine Laboratory of the University of California.

FREDERICK STARR, associate professor of anthropology at the University of Chicago, returned on January 1 from a four months' journey through Korea. Professor Starr has been made a Commander of the Order of Leopold II., by King Albert, of Belgium.

MR. WILFRED H. OSGOOD, of the Field Museum of Natural History, accompanied by Mr. Malcolm P. Anderson, sailed on January 27 from New Orleans to Colon, *en route* to the west coast of South America and the Peruvian Andes. They will spend six to nine months collecting mammals and birds and studying the general faunal conditions in that region.

PROFESSOR C. V. PIPER, of the United States Department of Agriculture, has returned to Washington after a year's absence in the orient. Six months of this time were spent in the Philippine Islands investigating the possibilities of producing hay in the Philippines for the use of army horses. The remaining time was devoted mainly to a study of the agricultural conditions in India. Professor Piper brought back with him a large lot of seeds, principally grasses and legumes, which promise to be of value in the southern states and West Indies.

THE eighth lecture of the Harvey Society series will be delivered by Professor T. W. Richards, of Harvard University, on Saturday, February 3, 1912, at 8.30 P.M., at the New York Academy of Medicine, 17 West 43d Street. The subject is: "The Relations of Modern Chemistry to Medicine."

PROFESSOR W. L. TOWER, of the University of Chicago, delivered a lecture on December

20 to the members of the Science Club of the Kansas State Agricultural College at Manhattan on "The Modification of the Germ Plasm and Inheritance."

PROFESSOR D. H. TENNENT, of Bryn Mawr College, gave an afternoon and an evening lecture at Oberlin, on January 17, upon "Variation and Heredity in Echinoderms," basing his discussion on his hybridization experiments and the cytological analysis of their results.

DR. BARTON WARREN EVERMANN, chief of the Alaska Fisheries Service, U. S. Bureau of Fisheries, lectured before the Buffalo Society of Natural Sciences on Friday evening, January 19, on "The Alaska Fur-seal and the Fur-seal Question." He strongly approved the government policy of killing the surplus 3-year-old males, after making ample reservations for breeding purposes.

PROFESSOR LAFAYETTE B. MENDEL, of Yale University, gave an illustrated lecture before the Columbia University Chapter of the Sigma Xi Society on January 18, on "Nutrition and Growth."

PROFESSOR J. McKEEN CATTELL, of Columbia University, gave the foundation address at Indiana University on the morning of January 19. In the afternoon he spoke before the faculties on "Grades and Credits," and in the evening addressed the Society of Sigma Xi. On January 22, he gave an address before the faculties of the University of Illinois on "The Administration of a University," and in the evening discussed the question with the committee charged with framing a constitution for the university. On January 5, Professor Cattell gave an address at Lehigh University and in the evening addressed the faculties of Lehigh University and Lafayette College.

THE department of Natural History of the College of the City of New York announces the following public lectures, which will be given on Thursday afternoons at 4 o'clock:

February 8—Professor N. L. Britton, director of the New York Botanical Gardens: "Scenic and Floral Features of Cuba."

February 29—Dr. C. H. Townsend, director of

the New York Aquarium: "The Voyage of the *Albatross* to the Gulf of California."

March 7—Dr. C. William Beebe, curator of birds, New York Zoological Park: "Adventures of an Ornithologist in the Far East."

March 21—Dr. R. H. Lowie, assistant curator of anthropology, American Museum of Natural History: "An Ethnologist in the Field."

THE Naples Table Association for promoting Laboratory Research by Women calls attention to the opportunities for research in zoology, botany and physiology provided by the foundation of this table. The year of the association begins in April and all applications for the year 1912-13 should be sent to the secretary on or before March 1, 1912. A prize of \$1,000 has been offered periodically by the association for the best thesis written by a woman on a scientific subject, embodying new observations and new conclusions based on an independent laboratory research in biological (including psychological), chemical or physical science. In April, 1911, the prize was named the Ellen Richards Research Prize. The sixth prize will be awarded in April, 1913. Application blanks, information in regard to the advantages at Naples for research and collection of material, and circulars giving the conditions of the award of the prize will be furnished by the secretary, Mrs. A. D. Mead, 283 Wayland Ave., Providence, R. I.

THE chairman of the finance committee of the New York Academy of Medicine, in sending out to members the treasurer's report, states that \$110,000 has been raised by subscription from about one fourth of the members, and that it is expected to collect about double that sum within the academy in order to pay for the real estate purchased as a site for the proposed enlarged building, before appealing to the general public for funds.

THE extension of the Horniman Museum, Forest Hill, consisting of a lecture hall and a new library, the gift of Mr. E. J. Horniman, son of the donor of the museum, was opened on January 27, by Sir Archibald Geikie, K.C.B., president of the Royal Society.

MR. ROBERT WILCOX SAYLES, in charge of the geological section of the Harvard University

Museum, has given the sum of \$5,000 to the Seismological Society of America, to aid in the publication of the Society's *Bulletin*.

THE Field Museum of Natural History, Chicago, has acquired recently, through purchase, the herbarium and botanical library of the late J. H. Schuette, of Green Bay, Wisconsin. The collection comprises 15,000 to 20,000 carefully prepared and fully labelled herbarium specimens, principally from Wisconsin, well representing the flora of the state. In addition to the general collection there is a valuable series of native American roses, the particular group of plants in which Mr. Schuette was for many years deeply interested and to which he gave critical study.

AMONG the dispositions of the will of Dr. O. M. Lannelongue, professor of surgery at the University of Paris, are the following: An annual sum of \$100 is left to the University of Paris, the same sum to the Faculty of Medicine for assisting necessitous students, and a sum of \$35,000 for the establishment of a museum, for which material had already been collected, in his native town, Castéra-Verduzan. Various other benefactions are conferred upon the town of Castéra-Verduzan. The residue of the property is to go towards the creation of some national or international work of a social or scientific order.

MR. CHARLES G. ABBOT, director of the Smithsonian Astrophysical Observatory, has returned to Washington from Bassour, Algeria, where he has been making astrophysical observations, in regard to the solar constant of radiation. The observing station in Bassour was established in July, 1911, when Mr. Abbot and his field assistant, Professor Frank P. Brackett, of Pomona College, arrived in Algeria, and observations were continued until the end of November. From previous work at Washington, Mount Wilson and Mount Whitney, it had been determined that the sun was probably a variable star, and that apparently its radiations frequently fluctuated from 2 to 5 per cent., during irregular periods of from five to ten days duration. Although strongly indicated by the work on Mount Wil-

son, the result was so important that it seemed necessary to test it further, by means of simultaneous independent observations held at Mount Wilson and some other high altitude station remote from there, where an equally cloudless atmosphere existed. These duplicate observations would eliminate all errors due to local atmospheric conditions. Mr. Abbot made complete determinations of the solar constant of radiation for forty-four days, in Bassour, while his assistant, Mr. L. B. Aldrich, made similar measurements at Mount Wilson, Cal. The two observing stations were separated by a distance nearly equal to that of one third the circumference of the earth. Unfortunately some cloudy weather was encountered at each of the stations, but the records of about thirty days will be available for comparison. If it seems necessary to make additional measurements it will be possible to continue the work this year, during June, July and August.

MORE than 200,000,000 barrels of oil, with a value of nearly \$128,000,000, were produced in the United States last year, according to David T. Day, of the United States Geological Survey, in an advance chapter on petroleum from "Mineral Resources of the United States" for 1910. The petroleum industry in the United States, says Dr. Day, has been characterized by a phenomenal increase each year for the last four years. Each year's gain over that of the year before has been so remarkable as to lead to the belief that the limit of production had been reached, but the increase has continued rapidly. After varying between 50,000,000 and 60,000,000 barrels annually in the decade between 1890 and 1900, the oil output was over 63,000,000 barrels in 1900 and increased to 88,000,000 barrels in 1902. In 1903 it passed the 100,000,000-barrel mark, in 1904 it was over 170,000,000 barrels, and in 1905 nearly 135,000,000 barrels. After a slight decline in 1906 the output rose again, in 1907 reaching 166,000,000 barrels. It was 178,000,000 barrels in 1908, 183,000,000 barrels in 1909, and 209,556,048 barrels in 1910, a gain of 14 per cent. over the record output of 1909. This brought

the total output since the beginning of the petroleum industry to more than two billion barrels. The United States is now by far the greatest oil-producing country; in fact, it produces more than all the rest of the world together. In 1910 the wells of this country yielded nearly 64 per cent. of the total production, Russia scoring a very poor second with about 70,000,000 barrels, or 21 per cent. The production of other countries is comparatively negligible, the third on the list, Galicia, contributing only 3.87 per cent. of the total. The excess of the petroleum production of the United States over the normal demand is shown by the fact that the 209,556,048 barrels produced in 1910 brought a smaller return—\$127,896,328—than the 183,170,874 barrels in 1909, which was valued at \$128,328,427. The even smaller output in 1908, 178,000,000 barrels, was valued at still more—\$129,079,184. As the production has increased the average price has gone down from more than \$1 a barrel in 1900 to 61 cents in 1910. These repeated great increases in oil production have been due to the successive development of four great petroleum fields farther west than the old productive centers. By 1900 the country had adapted itself to the influx of oil from western Ohio and Indiana; then came in rapid succession the development of the Gulf field in Texas and Louisiana, the Mid-Continent field in Oklahoma and Kansas, and the Illinois field. In the meantime California's production had been increasing so rapidly that it became the dominant feature of 1909 and 1910, outstripping the production of any other state and promising to retain this supremacy in the future. The trade effect of these developments was largely discounted by the small proportion of gasoline and kerosene yielded by the Gulf and California oils and it was only when the superior character of the Mid-Continent oil was recognized that the middle western contributions began to be taken seriously in the general trade. Geographic and technical factors put California petroleum at a disadvantage compared with the eastern supply,

but the great production has compelled such advances in refining methods as to make it reasonably certain that California will in the future yield good refined products, including lubricating and illuminating oils.

THE results of the latest tests on reinforced concrete, conducted in the College of Engineering of the University of Wisconsin, have just been published by the university. In this bulletin suggestions are made as to the most economical mixture of cement, sand and gravel in making the concrete. It also contains data concerning the strength of different forms of reinforced columns. The loads that may be safely used in designing reinforced concrete columns and the strength of columns resting upon small footings are also dealt with, and conclusions given as to the behavior of the latter. The work in this field has been in progress for about ten years at the University of Wisconsin and the bulletin just published supplements one published about three years ago.

#### UNIVERSITY AND EDUCATIONAL NEWS

THE directors of Bryn Mawr College have formally accepted the bequest of \$750,000, made by the will of Emma Carola Woerishoffer, of New York, who was killed in an automobile accident last summer. The whole sum has been constituted as a permanent endowment fund, to be named the Emma Carola Woerishoffer Endowment Fund. A scholarship has been founded at the college in memory of Miss Anna Hallowell, of Philadelphia, by her family. The interest of the \$2,500 which is given will be used as a scholarship for an undergraduate student each year.

THE sum of \$50,000 has been given to Beloit College by Mrs. Rufus H. Sage, of Chicago, and will be applied to the endowment of the chair of English literature. The total endowment of the college—in active, interest-bearing securities—is now increased to \$1,251,000, aside from the value of the buildings.

THE University of California announces the establishment by Mr. F. M. Smith, of Oakland, California, of a research fellowship for

investigation of certain problems incident to the growth of cities in the San Francisco Bay region. Attention is to be directed especially to questions relating to the development of parks, playgrounds and other community interests demanding particular consideration of space available for growth. The stipend of the fellowship is \$1,000 per annum, and an additional sum of \$500 annually is provided for expenses of the investigation.

BUILDING operations on the new auditorium of the University of Michigan, made possible by Regent Hill's bequest of \$200,000, will soon be under way. The site has been chosen with a view to commanding a convenient approach when the campus extension plans shall have been carried out. The auditorium, with its two galleries, will have a seating capacity of 5,500.

M. GEORGES LEYGUES has given 25,000 francs to the University of Paris for the new Institute of Chemistry.

THE faculty of the College of Arts and Sciences of the University of Maine has made a change in the requirements for the B.A. degree, abolishing the requirement of ten hours in the classical department. Hereafter, neither Latin nor Greek will be required for admission to the college, nor for the B.A. degree. A broad group system has been adopted within which a student, under the advice of his major instructor and with certain restrictions, may elect his own course.

THE board of trustees of the College of the City of New York has authorized the opening of the college courses to mature and properly qualified applicants who do not wish to pursue the full curriculum leading to a degree. In the department of chemistry special courses are offered in analytical, industrial, organic, physical and electrochemistry with opportunities for investigation. Full particulars may be had by addressing Professor Charles Baskevill, College of the City of New York.

ANNOUNCEMENT is made that the formal inauguration of Dr. John Grier Hibben as president of Princeton University will take place early in May. Dr. Hibben will continue to